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5 A hierarchical single-key-lock access control using the Chinese remainder theorem

Kim S. Lee, Huizhu Lu, D. D. Fisher
April 1992 **Proceedings of the 1992 ACM/SIGAPP Symposium on Applied computing: technological challenges of the 1990's**
Publisher: ACM Press
Full text available: pdf(509.16 KB) Additional Information: full citation, references, index terms

6 Session 5: Hierarchical database decomposition: a technique for database concurrency control

Meichun Hsu, Stuart E. Madnick
March 1983 **Proceedings of the 2nd ACM SIGACT-SIGMOD symposium on Principles of database systems**
Publisher: ACM Press
Full text available: pdf(1.08 MB) Additional Information: full citation, abstract, references, citings

The classical approaches to enforcing serializability are the *two-phase locking* technique and the *timestamp ondering* technique. Either approach requires that a read operation from a transaction be *negistered* (in the form of either a read timestamp or a read lock), so that a write operation from a concurrent transaction will not interfere improperly with the read operation. However, setting a lock or leaving a timestamp with a data element is an expensive operation. The purpo ...

7 The DIAMOND security policy for object-oriented databases

Linda M. Null, Johnny Wong
March 1992 **Proceedings of the 1992 ACM/SIGAPP symposium on Applied computing: technological challenges of the 1990's**
Publisher: ACM Press
Full text available: pdf(780.49 KB) Additional Information: full citation, references, index terms

8 Safe locking policies for dynamic databases

Vinay K. Chaudhri, Vassos Hadzilacos
May 1995 **Proceedings of the fourteenth ACM SIGACT-SIGMOD-SIGART symposium on Principles of database systems**
Publisher: ACM Press
Full text available: pdf(1.28 MB) Additional Information: full citation, references, index terms

Keywords: concurrency control, correctness issues

9 A decomposition solution to the queueing network model of the centralized DBMS with static locking

Alexander Thomasian, In Kyung Ryu
August 1983 **Proceedings of the 1983 ACM SIGMETRICS conference on Measurement and modeling of computer systems**
Publisher: ACM Press
Full text available: pdf(938.62 KB) Additional Information: full citation, abstract, references, citings, index terms

The effect of concurrency control methods on the performance of computer systems is analyzed in the context of a centralized database with a static lock request policy, i.e.,

database transactions should acquire all locks before their activation. In the lock conflict model the L locks required by each transaction are uniformly distributed over the N locks in the database. The computer system is modelled as a queueing network. Two scheduling policies for transaction activation are considered ...

10 The overhead of locking (and commit) protocols in distributed databases

Ouri Wolfson
September 1987 **ACM Transactions on Database Systems (TODS)**, Volume 12 Issue 3
Publisher: ACM Press

Full text available: pdf(1.56 MB) Additional Information: full citation, abstract, references, citings, index terms, review

The main purpose of a locking protocol is to ensure correct interleaving of actions executed by concurrent transactions. The locking protocol consists of a set of rules dictating how accessed entities should be locked and unlocked. As a result of obeying the rules, transactions in a distributed database incur an overhead. We propose three measures of evaluating this overhead, each most suitable to a different type of underlying communication network. Then, using a graph theoretic model, we ...

11 Investigations in tree locking for compiled database applications

Heng Yu, Grant E. Weddell
October 2004 **Proceedings of the 2004 conference of the Centre for Advanced Studies on Collaborative research**
Publisher: IBM Press

Full text available: pdf(273.86 KB) Additional Information: full citation, abstract, references, index terms

We report on initial research in tree locking (TL) schemes for compiled database applications. Such applications have a repository style of architecture in which a collection of software modules operate on a common database in terms of a set of predefined transaction types, an architectural view that is also useful for embedded control programs. Since TL schemes are deadlock free, it becomes possible to entirely decouple concurrency control from any functionality relating to recovery. This pr ...

12 A hierarchical approach to concurrency control for multidatabases

Yungho Leu, Ahmed K. Elmagarmid
July 1990 **Proceedings of the second international symposium on Databases in parallel and distributed systems**
Publisher: ACM Press

Full text available: pdf(841.52 KB) Additional Information: full citation, abstract, references, citings, index terms

A multidatabase system is a facility that allows access to data stored in multiple autonomous and possibly heterogeneous database systems. In order to support atomic updates across multiple database systems, a global concurrency control algorithm is required. Hierarchical concurrency control has been proposed as one possible approach for multidatabase systems. However, to apply this approach, some restrictions have to be imposed on the local concurrency control algorithms. In this paper, we ...

13 Concurrency control issues in nested transactions

Theo Härder, Kurt Rothermel
January 1993 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 2 Issue 1
Publisher: Springer-Verlag New York, Inc.

Full text available: pdf(1.90 MB) Additional Information: full citation, abstract, references, citings

The concept of nested transactions offers more decomposable execution units and finer-grained control over concurrency and recovery than "flat" transactions. Furthermore, it

supports the decomposition of a "unit of work" into subtasks and their appropriate distribution in a computer system as a prerequisite of intratransaction parallelism. However, to exploit its full potential, suitable granules of concurrency control as well as access modes for shared data are necessary. In this article, we in ...

Keywords: concurrency control, locking, nested transactions, object hierarchies

14 Using semantic knowledge for transaction processing in a distributed database

Hector Garcia-Molina
June 1983 **ACM Transactions on Database Systems (TODS)**, Volume 8 Issue 2
Publisher: ACM Press

Full text available: pdf(2.36 MB) Additional Information: full citation, abstract, references, citings, index terms

This paper investigates how the semantic knowledge of an application can be used in a distributed database to process transactions efficiently and to avoid some of the delays associated with failures. The main idea is to allow nonserializable schedules which preserve consistency and which are acceptable to the system users. To produce such schedules, the transaction processing mechanism receives semantic information from the users in the form of transaction semantic types, a division of tra ...

Keywords: concurrency control, consistency, locking, schedule, semantic knowledge, serializability

15 The queue protocol: a deadlock-free, homogeneous, non-two-phase locking protocol

Udo Kelter
March 1988 **Proceedings of the seventh ACM SIGACT-SIGMOD-SIGART symposium on Principles of database systems**
Publisher: ACM Press

Full text available: pdf(1.00 MB) Additional Information: full citation, abstract, references

The M-pitfall protocol (MPP) is the most general homogeneous non-two-phase locking protocol which supports shared and exclusive locks. It has two major disadvantages: it is not deadlock-free and it has the paradoxical property that concurrency is often reduced if shared locks are used instead of exclusive locks. This paper presents a new protocol, the Queue Protocol (QP), which removes these deficiencies. Although the QP can be regarded an enhancement of the MPP, pitfalls are no more used i ...

16 Deadlock freedom using edge locks

Henry F. Korth
December 1982 **ACM Transactions on Database Systems (TODS)**, Volume 7 Issue 4
Publisher: ACM Press

Full text available: pdf(370.72 KB) Additional Information: full citation, abstract, references, citings, index terms

We define a series of locking protocols for database systems that all have three main features: freedom from deadlock, multiple granularity, and support for general collections of locking primitives. A rooted directed acyclic graph is used to represent multiple granularities, as in System R. Deadlock freedom is guaranteed by extending the System R protocol to require locks on edges of the graph in addition to the locks required on nodes.

Keywords: concurrency control, locking, serializability

17 A locking protocol for resource coordination in distributed databases

Daniel A. Menasce, Gerald J. Popek, Richard R. Muntz
June 1980 **ACM Transactions on Database Systems (TODS)**, Volume 5 Issue 2
Publisher: ACM Press

Full text available: pdf(2.69 MB) Additional Information: full citation, abstract, references, citings, index terms

A locking protocol to coordinate access to a distributed database and to maintain system consistency throughout normal and abnormal conditions is presented. The proposed protocol is robust in the face of crashes of any participating site, as well as communication failures. Recovery from any number of failures during normal operation or any of the recovery stages is supported. Recovery is done in such a way that maximum forward progress is achieved by the recovery procedures. Integration of ...

Keywords: concurrency, consistency, crash recovery, distributed databases, locking protocol

18 Database concurrency control: An optimality theory of concurrency control for databases
H. T. Kung, C. H. Papadimitriou
May 1979 **Proceedings of the 1979 ACM SIGMOD international conference on Management of data**
Publisher: ACM Press
Full text available: pdf(1.16 MB) Additional Information: full citation, references, citings

19 A database approach for managing VLSI design data
Randy H. Katz
January 1982 **Proceedings of the 19th conference on Design automation**
Publisher: IEEE Press

Full text available: pdf(830.15 KB) Additional Information: full citation, abstract, references, citings, index terms

We describe an approach to managing information about VLSI designs, founded upon database system methods. A database component provides a low-level flat-file interface to stored data. Built on top is a design data management system, supporting the hierarchical construction of a design from primitive cells, and organizing data about alternative design representations and versions. Programs to provide a tailored interface to design data are also provided. The system simplifies the rapid const ...

20 Analysis of database performance with dynamic locking
In Kyung Ryu, Alexander Thomasian
July 1990 **Journal of the ACM (JACM)**, Volume 37 Issue 3
Publisher: ACM Press

Full text available: pdf(2.11 MB) Additional Information: full citation, abstract, references, citings, index terms, review

A detailed model of a transaction processing system with dynamic locking is developed and analyzed. Transaction classes are distinguished on the basis of the number of data items accessed and the access mode (read-only/update). The performance of the system is affected by transaction blocking and restarts, due to lock conflicts that do not or do cause deadlocks, respectively. The probability of these events is determined by the characteristics of transactions and the database access pattern ...